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MECHANICAL APPLIANCES

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IN

UTERINE SURGERY.

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## MECHANICAL APPLIANCES IN UTERINE SURGERY.<sup>1</sup>

PERSONAL observation of the injuries resulting from the improper use of mechanical appliances in many instances, and of the numerous and great benefits derived from the judicious employment of them in other cases, has suggested the theme of this paper. It is unnecessary here to dwell upon the literature of this subject, which has been fully presented by many of the recent works on gynaecology. Let us turn at once to a brief consideration of some of the causes of misplacements of the uterus. These may be classified in two general divisions: (1) those originating in the uterus itself, and (2) those external to that organ.

### I. CAUSES ORIGINATING IN THE UTERUS ITSELF.

1. *Congenital Malposition.* This is usually unattended by any troublesome symptoms until the age of puberty, when, in consequence of the great stimulus which the uterus then receives, and of its development, the misplacement of the organ is proportionally augmented, and those phenomena, too familiar to all practitioners to require recital, begin to be manifested, and to call for special treatment.

2. *Pregnancy.* The uterus in its gravid state is necessarily subject to a series of misplacements which generally demand no particular appliance, but which may, especially in the earlier or the later months, require either an intra-vaginal or an extra-abdominal support.

3. *Subinvolution* often exists without misplacement; yet the size and weight of the organ have a tendency to produce some abnormal position, and to furnish those cases which most of the profession have either seen or been called upon to treat.

4. *Congestion* may be the primary, but is not the immediate, cause of misplacement; as occurs to a slight extent during menstruation, when, by the increased weight of the uterus, it is temporarily misplaced. Who has not observed, when malposition from some other cause previously existed, that the suffering of the patient was greatly increased at this period, not only by the existing congestion, but by the additional misplacement which it produced?

<sup>1</sup> Read before the Boston Society for Medical Observation.



5. *Hypertrophy and Hyperplasia*, so far as our subject is concerned, produce similar results; for it is obvious that the tendency to misplacement would be as likely to follow an enlargement from a multiplicity of cells as from an increase in the size of each cell.

6. *Fluids retained in the Uterine Cavity*, like the preceding causes, may produce misplacements primarily by augmenting the weight of the organ, and secondarily by weakening its supports, of which we shall soon speak. Or, if the gradual accumulation of fluid be not accompanied by a corresponding increase of the uterine tissue, it may produce such changes as to belong to our next class.

7. *Degeneration of the Uterine Tissue*, which may arise from imnutrition, undue and unnatural pressure, imperfect circulation, and by the deposit or development of some abnormal element within the walls; all of these, weakening its own structure, tend to produce misplacement.

8. *Abnormal Growths*, as the various uterine tumors, are very liable to produce misplacement in ways already indicated.

## II. CAUSES EXTERNAL TO THE UTERUS.

1. *Congenital Malformation of the Vagina*. In cases of undeveloped uterus, this condition is almost invariably found, and is generally attended by a diminution in the length of that canal, which may be the cause of retroversion. Or, when there is an almost entire absence of the vagina, it of course fails to give the normal support to the uterus.

2. *Excessive Abdominal Pressure*. The ordinary weight of the abdominal viscera is as much as the almost insufficient supports of the organ can safely endure. But if this weight be increased by any abdominal or pelvic growth, or by a large amount of fluid in the cavity of the abdomen, or by an accumulated weight in the viscera themselves; or if the usual weight of these viscera be thrown violently upon the uterus, as in a sudden fall, this organ may be displaced. The same result may follow a less violent or a long-continued increased pressure, as in dancing or tight lacing. Of all the causes of misplacement probably the latter is the most common.

3. *Laceration of the Perinæum*. By this, reference is made not only to those cases where the injury extends through the sphincter muscle, but also to others where any portion of the muscle or the tissues down to that muscle are involved. The loss of so important a support allows the vagina to prolapse, and this in turn brings down the uterus, which naturally follows the axis of the pelvis; precisely as when the abutment of a bridge is swept away, the whole structure must fall.

4. *Relaxed State of the Vagina*. There is a class of cases in which, though the perinæum be not torn, yet the act of parturition has caused either an atrophy and degeneration of muscular tissue, or a sundering

of the union of the transverse perineal muscles to their several attachments; or there may exist a subinvolution of the vagina. All of these conditions would subsequently induce the same trouble as that just referred to. This relaxed state may also occur from a want of tone in the vaginal walls themselves, as may be sometimes seen in quite young women, and is then generally accompanied by a like condition of the rectum.

5. *Relaxed State of the Uterine Ligaments.* This is especially noticeable in those who have had many children. The tonicity of these supports is oftentimes thereby greatly impaired; or the same condition may arise from a debilitated state of the patient from any cause.

6. *Deposit of Fluids and the Contraction of Lymph.* When the misplacement arises from an effusion of liquor sanguinis into the cellular tissue upon either side of the uterus, the misplacement will obviously occur to the opposite side, and the most pain will then usually be experienced upon the side where the effusion occurred. But subsequently the contraction of lymph may draw the uterus far over to the side where the effusion first took place, and then the pain is oftentimes most severely felt upon the opposite side, on account of the great tension of the ligaments of that side. Or lymph being thrown out about the uterus, from whatever source, in contracting may greatly displace the organ, and fix it temporarily or even permanently to some of the pelvic viscera, or to the walls of the pelvis.

7. *Cicatrices of the Vagina*, whether caused from the results of severe or protracted labors or from injuries received at other times, or, as we have sometimes noticed, from the injudicious use of caustics, all tend to draw the uterus from its normal position.

The causes above enumerated suggest the nature and kinds of misplacement of most common occurrence. The term misplacement, as here used, denotes a removal of the uterus from its normal position. It will be clearly seen that the character and extent to which this deviation takes place may be various and very great. The normal position of the uterus changes with the different periods of life. In infancy, it is high up in the pelvis or almost entirely in the abdomen, and inclines forwards. At puberty, the fundus is found just below the plane of the superior strait, with its axis a little inclined forward from that of said strait. During the period of menstrual activity, it descends slightly in the pelvis, usually following the axis of that strait. After the climacteric period, the uterus in its atrophied condition tends toward its position before puberty. Influences may arise during any of these periods which may cause a deviation from this standard. As most of the causes fall within the third of these four periods, or that when the uterus is in a state of menstrual activity, we use the term normal position to describe its place at that time, as above indicated.

The kinds of misplacement are too familiar to all practitioners to require recital in this connection.

We are now prepared to consider the principal point of this paper: Are mechanical appliances justifiable in uterine surgery? and, if so, in what cases?

On these questions the profession is somewhat divided. Some, adopting the theory that nearly all misplacements are secondary to inflammatory action, seek relief for their patients by therapeutical agencies, and discard entirely mechanical appliances. Others, assuming that most uterine diseases are due primarily to misplacement, adopt the general use of such appliances. The truth, we believe, lies between these extremes; and the skill of the practitioner is best shown by the careful discrimination of cases in which they may be beneficial from those wherein they would be useless or positively injurious. This will be evident, if we consider, first, what is to be understood by mechanical appliances; and, secondly, when they are desirable and when objectionable.

Mechanical appliances, as here understood, are designed to assist in the support and maintenance of those organs and parts of the body contemplated in uterine surgery.

These are frequently classified according to the purpose which they are intended to subserve. But a more natural and simple division is according to the place to which they are applied. Thus we may have (1) those partially or entirely external to the body; (2) those which are intra-vaginal; and (3) those which are intra-uterine. Under this general division the various purposes of these instruments will naturally form subdivisions. Thus, under the first of these classes we have the various abdominal supports and all the different forms of pessaries which, being partially internal, yet have an external point of attachment. Under the second we have all those pessaries which take their bearing upon the symphysis pubis, under the pubic arch, or upon the vaginal walls. And under the third we have all the various forms of stem pessaries.

Were it possible to collect all the instruments that have been constructed and used in this department of surgery, they would of themselves form a large museum; and it would puzzle the most intelligent physician to determine the design and use of many of them. Some abdominal supports are very ancient, and still prove highly beneficial. Among the best now in use are the elastic and the London supporters, although a very efficient one is often made from simple cloth. Those having an external point of attachment, while they are applied internally, are usually constructed of hard rubber or some metallic substance, and should be avoided in every case where an intra-vaginal instrument can



be made to accomplish the result, lest from the motion of the body, as in walking, they produce excoriations, and thus become a source of great annoyance to the patient. As the dental surgeon must have an exact impression of the mouth to which he is to fit a set of teeth, so the uterine surgeon must adapt the appliance to the individual subject. Therefore it is often desirable first to construct a model of some ductile material, as block tin, which is readily adjusted to the particular case; and, this being done, the instrument can be duplicated from some more substantial and inflexible material. This law of adaptation must not be departed from, whether the pessary be constructed upon the plan of Hodge, Hurd, Hoffman, or others too numerous to be named, or of any modification of their inventions. That of Hodge, acting upon the principle of the lever, is generally preferred, being applicable to the greatest number of cases. The intra-uterine appliances are less various, and should be used with the greatest caution, on account of their liability to induce inflammatory action. For this reason certain practitioners entirely discard them, while others find them decidedly beneficial in certain cases. These may be so constructed as to secure slight galvanic action; or they may be made with a greater or less curvature, or even straight, according to the degree of flexion they are intended to overcome, or other purposes which they are designed to serve.

In the subsequent part of this article we propose to show, by the report of cases, wherein any of these appliances may be beneficial, when they may be dispensed with, and when they are positively injurious.

Having now considered and classified the causes of displacements of the uterus, defined the terms mechanical appliances, and described the structure, form, and principle of application of the most important, we are prepared to ask, (1) In what cases they are beneficial? (2) When they may be dispensed with? And (3) when they are positively injurious? These inquiries can be most satisfactorily answered by citing cases from our record-books in illustration of the particular class under consideration.

#### I. CASES IN WHICH MECHANICAL APPLIANCES ARE BENEFICIAL OR EVEN INDISPENSABLE.

CASE I. Mrs. B. had had six abortions, four of them having taken place since the birth of her last child; and when she came under my care she was threatened with a recurrence of the same accident.

On examination, the uterus was found completely retroverted and flexed, enlarged as in the second month of pregnancy, and exceedingly sensitive, with a slight discharge of blood from the os uteri. The patient was put to bed, and kept under the influence of opium for five days, at the end of which time the uterus was so tolerant that it could

be replaced without serious danger of abortion. This was done by bi-manual manipulation, the patient lying upon the back. A Hodge retroversion closed pessary was introduced.

The patient derived great comfort from the appliance, and three months afterwards, the uterus having risen out of the pelvis and all danger of a recurrence of the accident having passed, the pessary was removed, and she went on to the full term of her pregnancy.

In this case the cause of the previous abortions had undoubtedly been the malposition of the uterus; wedged into the hollow of the sacrum, as it enlarged the tendency to abortion became greater and greater. The patient being very anxious to have another child, she having but one living, it was a matter of great importance to her whether she could complete her term of pregnancy, or whether she must abort as on former occasions. If, then, we had replaced the uterus and had not used any mechanical appliance to retain it in position, it would almost certainly have returned to its retroverted state, and a recurrence of the threatened accident would have taken place. To remain quiet in bed until the uterus should reach that size which would enable it to rise out of the pelvis had been repeatedly tried in previous pregnancies without benefit; but on the contrary, the general health suffered so much by the confinement that it was worse than useless to attempt its repetition. Our object was only to be gained by exactly the treatment used; and the result in overcoming the threatened abortion, and carrying the patient over the time when its recurrence from a similar cause was past, proved the advantage of the appliance.

CASE II. Mrs. M., thirty-one years of age, had suffered more or less for ten years from dragging pains in both groins, great bearing-down, and backache, which had gradually but continuously increased, until at the time when I was first called to see her, July 2, 1874, her life was made perfectly miserable by the intensity of the above symptoms, even perfect quietude not giving her relief. The bowels were constipated, and the desire for micturition was very frequent. The patient was also made very unhappy by the fact that she was not able to suffer the slightest approach of her husband, sexual intercourse causing such severe pain.

Upon examination the cervix uteri was found crowded well forward against the symphysis pubis, by a subserous fibroid the size of the fist. Wedged into the hollow of the sacrum and nearly filling the excavation of the pelvis, this tumor formed with the uterus an immovable and highly sensitive mass. The uterus, somewhat retroflexed, admitted the uterine probe three and a half inches.

The treatment was first directed to relieving the sensibility of this neoplasm by hot vaginal injections and the application of the tincture of

iodine to the fornix of the vagina. By these means, at the end of two and one half weeks the tenderness was so far removed that attempts were made on alternate days to gradually work the fibroid up out of the excavation of the pelvis, past the promontory of the sacrum, and above the superior strait. This was a rather tedious undertaking; but by the 10th of August, that is, in three weeks from the time we were able to commence these manipulations, we had so far accomplished our object that we were able to introduce a Thomas's modification of Cutter's pessary with a perineal strap and abdominal belt. The patient's relief was almost immediate: the backache, bearing-down, and dragging pains disappeared, the action of the bowels and bladder became natural; and she was able to live in the full enjoyment of the marital relation. The patient, herself having been taught to remove and replace the pessary properly, and then feeling perfectly well and able to walk to and from my office, a distance of four miles, without any great fatigue, was discharged on the 17th of August. The pessary was subsequently changed for one of the same variety with a larger bulb, there being a tendency of the tumor to work down behind the instrument; but it continued to give the greatest relief.

Let it not be supposed that the above happy result can be so readily obtained in every similar case. It is sometimes only after the most long-continued and patient treatment that the hyperæsthesia can be removed to such an extent that an instrument can be tolerated.

It will be evident that a fibroid of the size of that described, having an attachment to the posterior wall and the fundus of the uterus, would tend to dislocate the uterus backwards; and even if the organ were replaced, unless some mechanical appliance were adjusted to support this increased weight, or to so far anteverte the whole mass that its return into its former dislocated position would be prevented, the relief to the patient would be only the most temporary. What, then, except the adjustment of some artificial support, in the above class of cases, can give any permanent relief to the sufferer? Surgical interference for the removal of the tumor would not be justifiable; for although the sufferings of the patient were great, yet life was not especially endangered, and so grave an operation would be unwarrantable.

I am well aware that a large number of additional cases might be given, illustrating this division of the subject; but those already cited sufficiently prove the great advantage often to be derived from the proper adjustment of some form of mechanical appliance to the uterus; and the practitioner who entirely discards such appliances sacrifices one of the most efficient means of giving relief to very many of his patients.



## II. CASES IN WHICH MECHANICAL APPLIANCES MAY BE DISPENSED WITH.

CASE I. Mrs. E., aged thirty-nine, was the mother of four children, the youngest of whom was about twelve years old. I was called to the patient in August, 1873, through the kindness of Dr. J. Marion Sims. She had been twice operated upon by him, once for intra-uterine fibroid tumor,<sup>1</sup> and subsequently for fungoid granulations of the mucous membrane. For several months previous to my seeing the patient her menstruation had been much too frequent in its recurrence, and the time of its continuance was very much prolonged; the amount of blood lost was also in great excess. Each month seemed to increase the difficulty until two months before she was seen, when pregnancy occurring, there was a cessation of the flow. Seven days before she came under my care, she was threatened with abortion, and took her bed; notwithstanding her precaution, two days afterward she aborted with an alarming hæmorrhage, which continued in a slight degree at intervals until my first visit.

Upon examination, the body of the uterus was found to be completely retroflexed and considerably enlarged; the external os was found open enough to admit the forefinger; but the internal os was very small. Feeling confident from the history of the case that, in addition to the probable existence of fungoid granulations, there was the remnant of an ovum there, I introduced two sponge tents, and after seven hours, the patient being etherized and the tents removed, the finger passed into the uterine cavity detected a soft, pulpy mass of about the size of a walnut, attached to the upper and posterior surfaces; also to some extent on the anterior surface were felt the peculiar hypertrophied utricular glands. With a Sims's curette these were all removed, the cavity of the uterus being most thoroughly curetted, until, by the sound conveyed by the curette and by the sensation which it gave to the touch, it was evident that we had reached the firmer sub-mucous and muscular tissue. The operation was accompanied by considerable hæmorrhage; but as it was very quickly done, and as the bleeding was readily controlled by putting a tampon into the cavity of the uterus as well as into the vagina, it was not a serious complication. The patient made a good, though rather slow, recovery from the operation. She went over the next menstrual period without any flow, but after that was quite regular and normal. The uterus gradually returned to its perfect position.

Now, had we been satisfied with diagnosing the malposition of the uterus and adjusting some mechanical appliance thereto, the result

<sup>1</sup> See his recent pamphlet on Intra-Uterine Fibroids.

<sup>2</sup> Since the above was written, the patient has been delivered by my respected friend, Dr. J. P. Reynolds.



could not have been satisfactory, for the remains of the ovum and the granulations still being in the cavity of the uterus, the hæmorrhage must continue, even though the uterine were sustained in its normal position; and until this cause of the hæmorrhage and the malposition were removed, there could be no hope of permanent benefit. But these causes of the misplacement being obviated, the tendency of the uterus was to regain its perfect position, although it received no aid from any artificial support.

CASE II. Mrs. N., thirty-five years of age, was admitted to the service of my highly respected instructor, Dr. T. Addis Emmet, in the Woman's Hospital of New York, during the month of December, 1873. She had been married twelve years, and had had one miscarriage at six months and subsequently a child, after a rapid labor, ten years before her admission to the hospital. For the latter length of time, although not entirely incapacitated from work, yet she constantly suffered through the lower part of the abdomen and back sharp pains which were greatly increased by walking. She had also a leucorrhœal discharge of a thick and tough consistence.

On examination, the uterus was found retroverted, and its cervix lacerated on the left side down to the vaginal junction and very much hypertrophied, its surface being covered with the discharge above described. One week after the patient's admission to the hospital, the writer operated upon the case for Dr. Emmet, for the closure of the lacerated cervix. The patient being etherized, this was successfully done, the hæmorrhage, which was considerable, being entirely controlled as soon as the sutures were introduced. She made a good recovery from the operation, and then the uterus being replaced, and some intra-uterine applications of impure carbolic acid made, the womb gradually regained its proper position, and the patient, feeling entirely relieved of her suffering, was discharged from the hospital, cured, January 17, 1874. She was seen four months afterwards, and had continued well. The uterus was then in a normal position, and the cervix looked perfectly natural, no evidences of the operation being visible.

In the above case, the malposition was undoubtedly due primarily to the condition of the cervix, and secondarily to that of the interior of the uterus. The indications were, first, to restore the cervix to its normal condition, or to that which it had previous to the birth of her child ten years earlier; and, second, to obtain a healthy state of the lining membrane of the uterus. The result of this course most certainly proved the correctness of the treatment. Had we attempted to use any mechanical appliance to correct the malposition of the uterus before the natural condition of the cervix had been restored, we should have greatly aggravated the case, for such treatment could not have failed to increase the already greatly irritated cervix. As it was, the beneficial result

proved to us that in the above class of cases, at least, mechanical appliances may be entirely dispensed with.

The cases just cited especially show the importance of discovering the cause of the misplacement; for it may be found that after the removal of this cause, any artificial support will be quite unnecessary.

### III. CASES IN WHICH MECHANICAL APPLIANCES ARE POSITIVELY INJURIOUS.

It is very evident that under this class, any case may come in which the appliance is improperly adjusted, however great the misplacement or the urgency of the case may be, demanding such an appliance. In illustration of this fact, let me give the following, which came under my observation at the Woman's Hospital.

CASE I. I. M. was admitted to the service of my esteemed instructor, Professor T. G. Thomas, early in the year 1874. She was a single woman, thirty years of age. About five years previous to her admission to the hospital, she suffered from some misplacement of the uterus; the physician attending her, in attempting to adjust an intra-vaginal pessary, introduced it through the urethra into the bladder, where it remained for a year and a half; but it finally caused so much distress from the cystitis which it created, without at all relieving the misplacement which it was designed to correct, that its removal was contemplated. But before this could be accomplished, it became necessary to cut through the anterior vaginal wall into the bladder, thus forming a vesico-vaginal fistula. Seven months after the pessary was thus removed from the bladder, it was discovered that a calculus had formed there, which was also removed through the same artificial opening. She was then operated upon twice unsuccessfully for the closure of the fistula which had been created. The third attempt for its closure was made by Professor Thomas, which proved successful, and the patient returned home a few weeks afterwards.

By this aggravated case it will be seen how great an amount of damage may be done, and how much suffering caused, by the improper use of a mechanical appliance in this branch of surgery. But let it not be supposed that a less serious result may not sometimes follow the more careful adjustment of a pessary, even where the greatest attention is bestowed as to the proper introduction of the appliance and the most strict injunctions are laid down as to its subsequent use. This will be seen by the following.

CASE II. M. C. presented herself at my clinic in New York during the month of December, 1873. She was twenty years of age, single, and had complained more or less since her arrival in this country, about a year previous. Her principal symptoms were constant pain in the back and down the thighs, and her extremely nervous condition.

These, together with her inability to be much on her feet, incapacitated her for her work, which was that of a chamber-girl.

Upon examination the uterus was found to be retroverted, but was very readily replaced in its normal position. The passage of the uterine probe was not followed by any show of blood; neither did it cause the patient the slightest pain. There was no special sensitiveness of the organ, and its malposition seemed due to some sudden and undue abdominal pressure, undoubtedly occurring during her passage on ship-board to this country. The uterus having been put into a normal position, a retroversion pessary of very small size was introduced; and (as was my custom in my out-patient department) the patient was told to walk about a block or two, and returning to remove the pessary herself. This was done to prove, first, that the instrument gave her no discomfort; and, secondly, that after her return home, in case she should have any such discomfort, she might be able at once to remove the pessary. These instructions having been carried out, the pessary was reintroduced, and the patient sent home with the strict injunctions, not only to herself but also to her sister, who accompanied her, to remove it upon the approach of the slightest pain or even discomfort. She was directed to return in one week, that I might be assured that the pessary was accomplishing the desired object, and that she was receiving no harm from its use. But in five days from the date of its introduction, the sister came back with the following account of the patient's condition: For two days she had almost entire relief from the pain in the back, and would not have known she had any pessary in the vagina, had she not been informed and instructed concerning it. Then commenced some uncomfortableness, which increased to a decided pain; but having found so much relief from the use of the support during the previous two days, she was unwilling to have the pessary removed. The fourth night she had a severe chill, followed by high fever and great pain over the abdomen. Her suffering was then so intense that she permitted her sister to remove the pessary. The fifth day I found the patient with a temperature of  $103^{\circ}$ , taken in the axilla; the pulse was 112. The girl evidently was suffering from a severe attack of cellulitis of the right broad ligament. She was at once put upon appropriate treatment, and in a little more than three weeks was back in my clinic. The uterus was fixed to the right side, but under treatment it was freed from its attachments so that it could be restored to a normal position.

Here, then, is a case where the introduction of an artificial support to the uterus gave rise to alarming, even dangerous, symptoms. But on account of these occasional accidents, are we to discard pessaries altogether? When we call to mind the number of cases where their use has been found indispensable, and the still greater number where



they have been exceedingly beneficial, we certainly feel unwilling to give them up. We rather heed the injunction which requires additional caution for a still more strict discrimination of the classes of cases in which their use may be most beneficial. Even in such instances we should exercise still greater care and watchfulness in the subsequent treatment of the patient. Doubtless we shall continue to use them, and the good results usually obtained will prove the correctness of our judgment.

These examples might be almost indefinitely multiplied, in illustration not only of the topics we have especially treated, but also on other branches of this general subject. To some of the latter, allusion has already been made; others, daily practice is continually bringing to our notice. But we trust enough has been said to establish the main points of this paper: that mechanical appliances in certain cases are positively injurious; in others they may be partially or wholly dispensed with; while in a third class they are altogether indispensable.

In this as in many departments of medical practice, the truth, we believe, lies between the extremes of absolute disuse on the one hand and universal application on the other; and the skill of the practitioner is exhibited in discriminating between those cases which are, and those which are not, the proper subjects for such appliances. \*





